

1. (Three times amended) A pair of nucleic acid probes having comparable size, said size being selected from the group consisting of from 1 to 100 kb, from 1 to 10 kb, 7 to 15 kb, 10 to 20 kb, 10 to 30 kb, 20 to 40 kb, 30 to 50 kb, 40 to 60 kb, 50 to 70 kb, 60 to 80 kb, 70 to 90 kb, and 80 to 100 kb, and flanking a potential breakpoint in a chromosome, each of said pair of probes being labelled with at least one different reporter molecule.

2. (Three times amended) A pair of nucleic acid probes of comparable size, said size being selected from the group consisting of from 1 to 100 kb, from 1 to 10 kb, 7 to 15 kb, 10 to 20 kb, 10 to 30 kb, 20 to 40 kb, 30 to 50 kb, 40 to 60 kb, 50 to 70 kb, 60 to 80 kb, 70 to 90 kb, and 80 to 100 kb, and flanking a potential breakpoint in a chromosome, which pair of nucleic acid probes hybridize to a nucleic acid molecule at a genomic distance of from about 50 kb to no more than 100 kb.

3. (Three times amended) The pair of nucleic acid probes of comparable size of claim 1, which pair of nucleic acid probes hybridize to a nucleic acid molecule at a genomic distance of from about 50 kb to no more than 100 kb.

4. (Three times amended) The pair of nucleic acid probes of claim 2, each of said pair of nucleic acid probes being labelled directly or indirectly with at least one reporter molecule.

5. (Three times amended) The pair of nucleic acid probes of claim 4 wherein the at least one reporter molecule is selected from the group consisting of enzymes, chromophores, fluorochromes, and haptens.

6. (Three times amended) The pair of nucleic acid probes of claim 5 wherein the probes hybridize to a single corresponding nucleic acid molecule.

7. (Three times amended) The pair of nucleic acid probes of claim 6 wherein the single corresponding nucleic acid molecule is at least a fragment of a chromosome.

8. (Three times amended) The pair of nucleic acid probes of claim 7 wherein the chromosome is not aberrant.

9. (Three times amended) The pair of nucleic acid probes of claim 1 which hybridize *in situ*.

10. (Three times amended) The pair of nucleic acid probes of claim 9, which pair of probes each hybridize *in situ* to only a few linear DNA molecules per cell.

11. (Three times amended) A method of detecting a nucleic acid molecule having a chromosomal aberration, said method comprising:

providing a pair of nucleic acid probes to analyze a sample believed to contain said nucleic acid, said nucleic acid probes having comparable size, said size being selected from the group consisting of 1 to 100 kb, 1 to 10 kb, 7 to 15 kb, 10 to 20 kb, 10 to 30 kb, 20 to 40 kb, 30 to 50 kb, 40 to 60 kb, 50 to 70 kb, 60 to 80 kb, 70 to 90 kb and 80 to 100 kb, and said nucleic acid probes flanking a potential breakpoint in a chromosome, each of said pair of probes being labeled with at least one different reporter molecule;

hybridizing said nucleic acid probes to said nucleic acid; and
detecting the presence of said reporter molecule.

12. (Three Times amended) A method of detecting cells suspected of having a chromosomal aberration, said method comprising:

providing a pair of nucleic acid probes to analyze nucleic acid of said cells, said nucleic acid probes having comparable size, said size being selected from the group consisting of 1 to 100 kb, 1 to 10 kb, 7 to 15 kb, 10 to 20 kb, 10 to 30 kb, 20 to 40 kb, 30 to 50 kb, 40 to 60 kb, 50 to 70 kb, 60 to 80 kb, 70 to 90 kb and 80 to 100 kb, and said nucleic acid probes flanking a potential breakpoint in a chromosome, each of said pair of probes being labeled with at least one different reporter molecule;

hybridizing said nucleic acid probes to the nucleic acid of at least one of said cells; and
detecting the presence of said reporter molecule.

17. (Twice amended) The pair of nucleic acid probes of claim 1 wherein the probes hybridize to a single corresponding nucleic acid molecule.

18. (Twice amended) The pair of nucleic acid probes of claim 17 wherein the single corresponding nucleic acid molecule is at least a fragment of a chromosome.

19. (Twice amended) The pair of nucleic acid probes of claim 18 wherein the chromosome is not aberrant

20. (Twice amended) The pair of nucleic acid probes of claim 3 wherein the probes hybridize to a single corresponding nucleic acid molecule.

21. (Twice amended) The pair of nucleic acid probes of claim 20 wherein the single corresponding nucleic acid molecule is at least a fragment of a chromosome.